

**Transcript of initial interview with
Mr. Benjamin M. Locke**



Co-Chief Executive Officer of Tecogen Inc.



NASDAQ: TGEN

March 12, 2016

Mr. Benjamin M. Locke - Co-Chief Executive Officer. Benjamin M. Locke was named Co-Chief Executive Officer in October, 2014. Mr. Locke joined Tecogen in June, 2013 as the Director of Corporate Strategy and was promoted to General Manager prior to his appointment as Co-CEO. Previously Mr. Locke was the Director of Business Development and Government Affairs at Metabolix, responsible for developing and executing plans for partnerships, joint ventures, acquisitions, and other strategic arrangements for commercializing profitable clean energy technologies. Prior to joining Metabolix in 2001, Mr. Locke was Vice President of Research at Innovative Imaging Systems (IISI), a high-technology R&D company. At IISI, he drove the development and implementation of growth strategies for the funding of specialty electronic systems for the United States Government. Mr. Locke has a B.S. in Physics from the University of Massachusetts, an M.S. in Electrical Engineering from Tufts University, and an MBA in Corporate Finance from Boston University.

Smallcaps Investment Research: A warm welcome everyone to a new interview on Smallcaps Investment Research. We're pleased to have Mr. Ben Locke, the Co-Chief Executive Officer of Tecogen Inc, with us today. Tecogen manufactures and sells industrial and commercial cogeneration systems that produce combinations of electricity, hot water, and air conditioning. In addition, the Company is working on an emissions technology that could literally revolutionise the automotive industry. We'll find out more about that in this interview. Tecogen is listed on NASDAQ with ticker symbol TGEN. Thank you for joining us Ben, welcome.

Benjamin M. Locke: Glad to be here.

As this is our initial interview, could you give us an introduction of Tecogen, its history, and its activities?

Sure, I'd be happy to. Tecogen began in the early 1960s as a research division for Thermo Electron, which is now Thermo Fisher Scientific. Tecogen was part of a division of Thermo Electron called Thermo Power, and its focus was to develop new and innovative technologies for the parent company Thermo Electron. So ultimately, engineering and innovation has been in the DNA of Tecogen from the very early days.

As the research division under Thermo Electron, it started to develop the gas engine driven equipment, which Tecogen commercializes today, namely co-generation equipment, or CHP, chillers, and heat pumps.

During the late 1990s, Thermo Electron sold many divisions, and in 2000 Tecogen was sold to the original founders of Thermo Electron, George and John Hatsopoulos. George and John, having retired from Thermo Electron, wanted to continue to invest in the technology that Tecogen was working on.

They specifically invested in the technology that allows CHP equipment to continue to provide power if the electric grid were to go down, the so-called black start capability. In addition, George and John felt very strongly that emissions regulations were going to get much stricter. They realized that it would be very important for these gas engine driven products to have very good emissions profiles. So they also invested in developing emissions technologies.

So that brings us to where the company is today. We became publicly traded in April 2014. Our flagship product is the InVerde Combined Heat and Power system, which is able to provide power during blackouts and has emissions on par with fuel cells, which is revolutionary for a combustion engine. We recently launched an improved version of the InVerde, called the e+.

We're also making tremendous progress with the commercialization of our heat pumps and chillers. And finally, servicing all these products is becoming a big part of our revenue and profit stream.

Thank you. As you mentioned, Tecogen basically manufactures three types of products: cogeneration units that supply

electricity and hot water; chillers that provide air-conditioning and hot water; and high-efficiency water heaters. Can you briefly describe those three product categories and also what makes them so special?

I'll start with the **cogeneration units or CHP**. CHP has always been part of the overall area of 'distributed generation'. There's a very high demand for more electricity and at the same time, utilities have a limited capacity to generate enough electricity to satisfy that demand. And even more importantly, in between the supply and demand is the grid infrastructure. In many cases that was built in the 1950s and 1960s, and is quite worn out. So distributed generation is a way to relief the reliability on the congested grid.

Everyone knows about solar and wind as distributed generation, but CHP also is a very tried and reliable technology for getting independence from the grid. It enables buildings to produce both power and heat at very high efficiencies. Electricity that's generated by a power plant and gets transmitted over the lines, only reaches efficiencies of 30% or 40%. CHP equipment on the other hand are 80% to 90% efficient, because they're using all the waste heat and purposing that into the building.

Also the market for our **chillers** is growing, as electricity prices are getting higher and gas prices are very affordable. These chillers are basically giant air conditioners. If you look at the rooftop of any large building, you'd see these great big units that provide cooling for a building. Our chillers are much like those chillers with the exception that instead of an electric motor driving a compressor that produces the chilled air, our units have a natural gas engine. So, similar to our CHPs, a user's electric bill goes way down after installing one of our chillers. And the end result is the same, cooled air.

Moreover, critical care facilities such as hospitals are obligated to have backup generation to support all their important operations, including their chillers. When

they have electric chillers, they need enough backup generators to keep those electric chillers running, which is hundreds of kilowatts of backup generators. When they have a gas driven chiller instead, they only need a very small amount of electricity to keep the unit running. So our critical care customers also save money because they don't need as much backup generation. Tecogen is the only manufacturer of gas engine driven chillers on the market in our size category at this moment.

Then the last product is **heat pumps**. This is a more recently developed product of ours called Ilios. We have two models, an air source heat pump and a water source heat pump.

An air source heat pump takes heat from the air and moves it into a building. So you'll take our Ilios air source heat pump, and you put it in the warm climate such as Hawaii or Florida. It will pull in the air, take the heat out of that air and put it into a hot water loop that keeps the building warm. Also in this case, the waste heat of the engine is used.

The efficiency of an air source heat pump is up to 200%, as opposed of the existing boiler which is maybe 80% efficient. So our heat pump customers again generate tremendous cost savings.

And then the second model, which we introduced last year, is a water source heat pump. In this case, we're taking heat out of a chiller loop. This is especially useful in buildings that have a simultaneous need for air conditioning and hot water, such as hotels where guests take warm showers but also want cool rooms.

So where there's a combined need for heating and cooling, we'll put our Ilios water source heat pumps almost literally between the boiler and the chiller. That takes the heat out of the chiller loop and puts in to the boiler loop. These units reach an efficiency of upward of 300%.

Terrific. One item that I would like to highlight here is the brand new InVerde

e+ technology for your cogeneration units. Would you share some more details about that with us, and explain how that separates you from your competitors?

Well, the fundamental advantage of our original InVerde is its ability to interconnect to the grid in order to provide power during a blackout situation. Our new product, the InVerde e+ has many other improvements that ultimately result in additional savings for our customers.

For example, the amount of produced electricity is increased. As I mentioned, a CHP produces electricity and hot water. Electricity is the more valuable of the two. So it's always better to produce more electricity and less hot water. And that's essentially what this InVerde e+ does. It increases the electrical efficiency much higher than our previous product and the result of that is more electrical savings for the customer.

The other thing this InVerde e+ does, and this is especially very valuable in states such as New York, is that it can be used as a type 10 emergency power system. If the grid goes down, certain critical elements, such as water pumps and elevators, have to be running within 10 seconds. And when your cogen equipment is not able to turn on that quickly, then additional generators have to be installed to meet those emergency power requirements. Well, the new InVerde e+ has the ability to come back on and energize those loads under 10 seconds. So again, a very important cost saver.

And it has more improvements. The fact that it can run on very low pressure street gas for instance. Sometimes, when there's not enough gas pressure from the utility, a gas booster has to be installed, which is expensive. With the InVerde e+ that's not necessary.

Finally, the e+ is also equipped with a remote monitoring system, which allows us to see, in real time, how an installed unit is running. Imagine having a mobile device like your

phone or tablet, on which you're able to see how much power the unit is producing, how is it running, how long it's been running, etc. This is obviously a very useful tool for our service department, and at the same time it's easy to show a building manager that he's made a very good investment, making it a very good marketing tool.

Well, that's very impressive. Can you, on the basis of an example, describe what the advantages are of Tecogen's technology for an end-user?

Maybe I'll start with one particular example which illustrates the real value of our technology. There's a warehouse in New York that is completely off the electric grid because they're able to use our CHPs to power everything. And it was important to them because when they expanded their warehouse, they were forced to expand their electrical capacity, which was going to be very expensive. Instead, they opted to install six of our InVerde units.

They would not be able to do that with any other CHP technology because you have to be able to run two, three, four, five or sometimes six of these units smoothly with each other, handling load swings when compressors turn on and off. That's something that can only be accomplished with this microgrid technology that we have licensed exclusively for this CHP size range from the University of Wisconsin.

I use this example when I approach other industries that have requirements for off grid operation, such as data centers. Data centers need to have double back up or sometimes even triple back in case the grid goes down. A CHP system can be a cost effective way to provide one of those layers of backup.

That brings me to my next example, which is a residential building called the Brevoort. When superstorm Sandy came through late 2012, much of lower Manhattan lost power. But the Brevoort was one of the buildings that had our units installed and was able to keep the lights on, because gas service was

never interrupted, while all of the buildings surrounding them had no power. The InVerde units were able to provide power. People could charge their phones, flush the toilets, use the elevators until grid power was restored.

Because the equipment is built to last 20 or more years, most of the product sales are to first time customers. However, Tecogen generates increasingly more service revenues. What can you tell us about that and would you also give us some color on the margins of both product revenues and service revenues?

There are some very good incentives for installing CHP units particularly in New York, New Jersey, and Massachusetts. And many of these incentive programs require that the customer enters into a long-term service agreement with the product manufacturer, because those states want to make sure that their incentive actually has the life of the product in mind. So for example, the New York incentive requires a 5-year service agreement with the manufacturer and the New Jersey program request a 10-year service contract with the manufacturer. So we are growing our base of long-term service agreements.

At this moment, service revenues are about 30% of our total sales. And most of our service contracts have margins in the 40% to 50% range. While our product margins are typically around 30%. So our blended gross margin target is typically around 35% and our goal is to continue hitting that goal.

Let's focus on your Ultera technology, which is really wonderful. First, what exactly is this technology that you're offering and why is it important?

It all started in the late 2000s, when the California Clean Energy Commission did an inspection of all stationary engines in the state. They found that many of these engines were out of compliance. So they came up with even more strict air emission standards, which were going to be a very debilitating to stationary engines.

Fortunately, we anticipated that emissions would only get stricter a few years before these events. So when the new emission standards were implemented, our Ultera technology, which dramatically reduced the main smog criteria CO and NOx was ready.

So we were not only able to meet these very strict California Air Resources Board (CARB) emissions, but we were in fact able to beat them substantially. And that enabled us to keep our fleet up and running in California.

At this moment, the Ultera comes as an option on all of our systems. Although some states, such as New York, don't require it yet, I tell my customers that at some point in time, those very strict California air emissions standards are going to be adopted by other states. I know for instance that Massachusetts is starting to adopt them.

More recently, we started looking at stationary engines from other manufacturers that are having issues with emission standards. So we retrofit them with our Ultera emissions technology. This is a very straightforward retrofit. We don't have to open up the engine, or do anything too complex. It's really a second muffler that we put on top of the unit. And it works, we're able to get those units in compliance.

Has the Ultera system already been independently verified, and how many units are in use at the moment?

When we developed this technology, it was very important to get third party verification. In fact, the South Coast Air Quality Management District, the largest air quality management district in California, required that we get third party verification before we rolled out our Ultera technology.

So we used AVL, a very large company with a particular division in California that specializes in emissions. This company verified our emissions of our engines both for our CHP and our heat pumps. The result of these tests was subsequently published in a peer reviewed paper.

In addition, whenever we want to start up a new unit in California, it has to undergo source tests. Independent regulators will come in and test the emissions. So we've had hundreds of source test conducted on units that we've put into operation.

That's fantastic. A few months ago, following the Volkswagen emissions scandal, you started researching if the Ultera technology can be applied to gasoline fueled engines. How are you handling that and what progress has been made since?

We're very excited about this prospect, but as you can imagine, addressing the vehicle market is no small task. The first thing that we've done is form Ultra Emissions Technologies Ltd (Ultratek), a joint venture with a group of strategic investors. Now we're testing to see how our Ultera technology might actually integrate with a vehicle and what the results might be as compared to a vehicle without the emission system. We're working with AVL again on this.

The important aspect here is that we want to be absolutely sure about the Ultera's performance, before we start explaining anything to the general public. So at the moment, there's nothing really to announce, except that we're focusing on the testing with AVL and we're optimistic that we'll have some good results this year.

Back in November 2015, you announced third quarter financial results for the period ending September 30, 2015. Can you give us a brief recap of those results and can you also shed some light on your outlook for 2016?

Our sales in the third quarter increased by about 12% compared with the third quarter in 2014. We also maintained our margins. As I mentioned before, our target is 35%, and in the third quarter they were a little over 35%, versus margins of 26% in the comparable quarter of 2014. That strong increase is really the result of a focused effort to look for efficiencies in our manufacturing

process, and making sure that we get good prices from vendors.

Another area that we're very happy with is the Ilios heat pump. We sold the first units into the Atlanta area, so we're starting to expand our Southeast markets for Ilios. And then more importantly, we commissioned a seven unit site at a research institute in Florida during the quarter. That unit is running very well.

So it was a very good quarter for Tecogen. I think that's something we're going to see more of in 2016, as we grow the Ilios line, continue to address our core markets, and roll out our InVerde e+.

Do you expect to become cash flow positive this year?

That's certainly our goal. We're being careful about it though as there are many moving parts in terms of our investments and R&D, and product upgrades that we're introducing.

Good to know. Can you tell us a little bit about yourself and the other key executives of the Company?

As for myself, I'm an engineer by training. I have a degree in Physics and Master's in Electrical Engineering. I've been involved in selling technology from the very early days, working at a company that developed electrical systems for the US government. I subsequently worked at a biochemical/bioplastics manufacturer. And that's what I'm bringing to Tecogen, a very good understanding of the technology involving CHP and H-VAC equipment, and being able to help bring that into the market as quickly as possible.

Robert Panora has been with Tecogen since the Thermo Power days. Bob is a brilliant innovator with the InVerde and the Ultera emission system. He remains the solid core of our engineering team.

And then Dave Garrison our CFO, has experience as CFO for Arrhythmia Research Technology. He brings a wealth of

knowledge to increase the Company's margins, working with vendors, arranging our inventory, etc. Dave is really a valuable part of the team.

And last quarter we've started up an investor relations team, that's run by Ariel Babcock. She's been very helpful in reaching out to the investor community. As a public company, you need to have visibility and people understanding what you do and Ariel is very good at doing that.

And then of course, I have to mention John and George Hatsopoulos. Without them, none of us would be here. George Hatsopoulos has been the technology pioneer since Thermo Electron. He's since retired. But John is still with us. John is really a visionary in financing and running the Company.

Let's take a look at the future. During a recent conference call, following the announcement of the Ultratek Joint Venture, John Hatsopoulos, the co-CEO of Tecogen, mentioned that this might be the first of several partnerships. Could you elaborate somewhat on that?

Sure. There are several ways I would like to see Tecogen grow. I have my vision of having a wider product offering for CHP. Right now, our core products are 75kW and 100kW units. And there are times when you can install multiple units at one site, but there are also times when you really would like the ability to install a 500kW or even multi-megawatt units. So if we're able to find the right partner to extend our product offering, that's something I'd like to look at.

Also interesting is the fact that the biogas market heating up as more and more states have programs that re-use organic waste or a municipal solid waste. They have digesters that convert this waste to biogas. And then often times, they'll put in a cogeneration system on the backend to produce electricity. So having the technology that us to use biogas to produce CHP is something I'm looking forward to.

Finally, there are geographies outside the US where our technology would be a very good fit. It might make sense to partner with an existing company that already has sales and service force in those areas.

What's your outlook for Tecogen for the next 12 to 18 months?

I absolutely expect to see continued growth in our CHP business. I just came from a conference, where the focus was on CHP as a way to relief to congestion on the grid in very constrained areas such as New York and the east coast in general. So I expect that trend to continue.

I expect natural gas prices to continue to be very affordable. And I also expect electric prices to remain where they are, if not maybe increase a little bit. All of those things are going to help our core CHP and our chiller technology go forward.

Where I really anticipate seeing more growth is in new geographies. For example, we've been able to sell several Ilios units to customers in Hawaii. I hope to see more growth in Hawaii. Not just for Ilios but potentially for chillers as well.

Mexico is another area where we've had significant growth, especially for our chillers. There's an industrial manufacturing area in Mexico that has access to very cheap gas, but which has very high electric rates. Basically, a perfect fit for our chillers.

And then lastly, I want to talk about Europe. Although the CHP industry is thriving in Europe, there are certain challenges. One of the challenges is emission regulations. It's very difficult to reduce both CO and NOx levels at the same time. Often times, you have to pick one at the expense of the other. I think the European Union is starting to take a hard look at the emissions that CHPs are producing. And if those change, I think it would be a very good fit for our Ultera technology. I think that emission regulations are going to create an opportunity for us for stationary engines in Europe.

Before we go, what would you say are the two or three most compelling reasons for a long term investor to consider Tecogen today?

Well, I'm very excited about Ultratek. Testing if the Ultera technology has applicability to the vehicle market. That's certainly an exciting story and I think it's something that investors should really keep their eye on.

As far as the core of Tecogen, I want to broaden the business. If we're able to enter into a partnership for larger systems, then our addressable market would increase significantly. The market for micro CHPs is around \$2 billion a year. However, the market for a large scale CHP systems is upwards of \$40 or \$50 billion a year.

And then lastly, I'd like to expand into other geographies. Almost all of our business in the US right now. We have nine service centers here. As we start to expand into new markets, we'll also start up service centers there. And having service centers allows even more rapid growth. And of course, having recurring service revenues is very important as margins are high.

Well thank you Ben, it's been a pleasure speaking with you and we appreciate your time and insight. All the best to you and Tecogen, and I look forward to speaking with you again soon.

Thank you very much for the opportunity.

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